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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/955,030	09/19/2001	Kimiyuki Ito	44084-498	9406

7590 03/28/2003

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ART UNIT	PAPER NUMBER
1756	14

DATE MAILED: 03/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 14

Application Number: 09/955,030[1]
Filing Date: September 19, 2001
Appellant(s): ITO ET AL.

Edward Wise
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 3 March 2003.

[1] This application is a division of 08/693,717, which went abandoned after the BPAI decision in Appeal # 1998-3263.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct. The amendment filed 3 march 2003 has been entered.

(5) Summary of Invention

The summary of invention contained in the brief is correct. The Examiner notes that the claim described in the Summary of the Invention (i.e., claim 34) is not the broadest claim under Appeal. Claim 13 is broader because it does not require separate charge generating and charge transporting layers but requires only a photosensitive layer, which could be one layer.

(6) Issues

The appellant's statement of the issues in the brief is correct. The description of the rejected claims should not include claims 18, 19, 36, and 37 because these claims were canceled in the amendment of 3 march 2003.

(7) Grouping of Claims

The rejection of claims 13-17, 20, 21, 31-35, and 38-42 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7). The Examiner notes that Brief states that the appealed claims stand or fall together depending on whether independent claims 13 and 34 are patentable. Because Appellants do not specifically argue the limitations of claim 34 in the Brief nor the rejection over claim 34 and those dependent it is understood that the claims stand or fall together. Claim 13, referenced by Appellants, appears representative of the claims under appeal.

(8) Claims Appealed

A substantially correct copy of appealed claims 13-17, 20, 21, 31-35, 38-42 appears on pages 11-14 of the Appendix to the appellant's brief. The minor errors are as follows: claims 18, 19, 36, and 37 have been canceled.

(9) Prior Art of Record

US 5008172	Rokutanzono et al.	4-1991
US 5571456	Bergmann et al.	11-1996

Borsenberger, Paul M. et al. Organic Photoreceptors for Imaging Systems. New York: Marcel-Dekker, Inc. (1993) pp. 25-35 & 289-296.

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 13-17, 20, 21 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rokutanzono *et al.* in US Patent 5,008,172 in view of Bergmann *et al.* in US Patent 5,571,456.

Rokutanzono discloses a photosensitive member having an electroconductive substrate, a photoconductive layer on the substrate, and a surface protective layer having high transparency (col. 2, l. 43-61). The photoconductive layer contains a charge transport layer and a charge generation layer containing organic charge generation material (col. 4, l. 28-29 & 32-34). The surface protective layer contains a binder resin and metal oxide particles that have been surface treated by a silane coupling agent or a titanium coupling agent. Useful metal oxides particles include tin oxide doped with antimony (col. 2, l. 68 – col. 3, l. 1). These particles serve to lower the high resistivity of conventional surface layers (col. 1, l. 58 – col. 2, l. 8). These particles have a size of 0.3 microns or less (col. 3, l. 3-7). Example I presents a photosensitive member having a surface layer of 5 micron thickness formed from a solution having 18 parts of the metal oxide in a 30 weight parts solution of resin (40 wt. %). The metal oxide particles of the reference would be expected to be conductive because they lower the resistivity of the protective layer. The reference does not disclose tantalum doping of the tin oxide.

Bergmann discloses transparent coatings prepared from conductive tantalum-doped tin oxide powder having a size of 0.05 to 15 μm (cols. 3-4). This powder is processed into a layer with a binder resin. Useful doping amounts are 0.5 % tantalum as seen in Example 1, 2 % tantalum in Example 2, and 8.6 % tantalum in Example 3, for each tin oxide. Antimony and tantalum doped tin oxides are disclosed as conductive in the reference (col. 1, l. 41-45; Example 15). Antimony compounds are disclosed by Bergmann as undesirable because they cause coloring and are environmentally undesirable (col. 3, l. 26-38).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a tantalum-doped tin oxide powder into the conductive layer of Rokutanzozo in place of those conductive powders disclosed by that reference because Bergmann discloses that conductive tantalum-doped tin oxide powder is environmentally acceptable (col. 2; col. 3, l. 26-38) over metal-containing antimony-doped powders and teaches that the tantalum-doped tin oxide does not discolor. Rokuntanzono is concerned with transparency (i.e., discoloration) of the surface layer as discussed above. Further, a layer of this powder can be formed from an aqueous dispersion (col. 2). The aqueous dispersion is more desirable than less environmentally acceptable organic solvents. The artisan would also have been expected to optimize the amount of the doped tin oxide to give surface layer resistivities desired by the reference.

Claims 34, 35, and 38-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rokutanzono *et al.* in US Patent 5,008,172 in view of Bergmann *et al.* in US Patent 5,571,456 as applied to claim13-21 and 31-33 above, and further in view of *Organic Photoreceptors for Imaging Systems*, to Borsenberger, pp. 25-35 & 289-296.

Rokutanzono and Bergmann were discussed above. The references do not specify the charge generating and transporting layers as being organic (e.g., organic charge generating material or charge transporting layer with a binder resin), but the Borsenberger text discloses organic materials are well known in the art for laminate photoconductors having a charge generation layer and a charge transport layer (pp. 28-29& Figure 3). The organic materials permit the artisan to produce layers having flexibility and low thermal generation rates (pp. 29-30). Organic layers also have a low production cost (p. 30). Specific processes for forming the organic charge generation and organic charge transport layer having a binder resin are given on pages 289-296. Note the organic charge generating pigments at the top of page 295 (e.g., azo, phthalocyanines, squarines). As seen in Figure 1 (p. 290), an overcoat layer is a common expedient for laminate photoconductors having organic layers.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an organic charge generation material in a charge generating layer and an organic charge transport layer having a binder resin as the photosensitive layer in Rokutanzono because the primary reference discloses that laminate photoreceptors having charge generation and charge transport layers are desired and the Borsenberger reference teaches that organic charge generation and organic binder-containing charge transport layers are useful in the art because of their low production cost, low thermal generation characteristics, and flexibility. Flexibility would be particularly desirable in Rokutanzono when producing belt photoreceptors (col. 4, l. 52). The other reasons for holding of obviousness in the parent rejection are incorporated here.

(11) Response to Argument

Appellants traverse the rejections because, in their opinion, the Examiner has not set forth a *prima facie* case of obviousness. Although Rokutanzono does disclose a photosensitive member having a photosensitive member and an exterior layer containing tin oxide doped with antimony with a size of from 0.3 micrometers or less, Rokutanzono does not disclose the exterior surface layer containing tantalum doped tin oxide with a particle size of 0.3 to 1.0 micrometers and does not disclose the results of the present invention. Appellants also state that the supporting Bergmann reference discloses conductive tantalum-doped tin oxide powder having a size of from about 0.05 to about 15 micrometers, but does not disclose the photosensitive member having an exterior surface layer containing titanium tin oxide. Bergmann also does not disclose the results of the instant invention. Appellants state that the fact that Bergmann discloses the conductive Ta-doped tin oxide is environmentally acceptable in various conductive layer applications does not provide sufficient basis for the combination rejection because Bergmann does not suggest the modification of Rokutanzono's photosensitive member proposed. The fact that the modification could be made does not necessarily motivate the obviousness of making the modification proposed by the Examiner. Impermissible hindsight is stated as being employed by the Examiner. The prior art as a whole must be relied upon and this art does not suggest the modification to Rokutanzono suggested by the Examiner.

Obviousness requires a factual inquiry following the guidance set forth by the US Supreme Court in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966). Following *Graham* v. *John Deere Co.*, the Examiner has determined the scope and contents of the prior art and ascertained the differences between the prior art and the claims as discussed above. The primary reference discloses each of the features of the claimed invention such as

independent claims 13 and 34 with the exception of the tantalum-doped tin oxide powder in an exterior layer of the member (Sb-doped tin oxide is disclosed). This Ta-doped tin oxide powder is disclosed for electroconductive layers by the supporting Bergmann reference.

For emphasis, the Examiner notes Rokutanzono's discussion that metal and metal oxides have been added to the prior art photosensitive member surface layers (col. 2, l. 4-8) as resistivity controlling agents. These particles would be understood by the artisan as conductive because they serve to lower the resistivity of the high resistivity of conventional surface layers (col. 1, l. 58-63). These agents are not totally effective, however, because they absorb light (col. 2, l. 9-13) causing imaging problems. Smaller sized metal oxide particles are disclosed as one alternative in the art to overcome this problem, but image flow occurs. Treatment of the conductive metal oxides is effective to reduce the image flow problem, particularly under high humidity environments (col. 2, l. 27-31). Rokutanzono discloses treating Sb-doped tin oxides to give the proper resistivity to the surface layer, while obtaining improved imaging under adverse environmental conditions.

Bergmann discloses transparent coatings prepared from environmentally acceptable, conductive, tantalum-doped tin oxide powder. The powder has a size of 0.05 to 15 μm (cols. 3-4), which overlaps with the particle sizes disclosed by Rokutanzono and those of the instant claims. This powder is processed into a layer with a binder resin. Useful doping amounts are 0.5 % tantalum as seen in Example 1, 2 % tantalum in Example 2, and 8.6 % tantalum in Example 3, for each tin oxide. Antimony and tantalum doped tin oxides are disclosed as conductive in the reference (col. 1, l. 41-45; Example 15).

The combination of references which renders the claims obvious is motivated by the references themselves noting the desire to use less toxic conductive tantalum-doped tin oxides in more environmentally acceptable aqueous dispersions to form conductive layers in

Bergmann. Further, Bergmann notes that antimony compounds (which are used by Rokutanzono) tend to discolor (i.e., impair transparency) thus motivating the use of Bergmann's oxides in Rokutanzono's exterior layer. Light absorption is a specific concern in Rokutanzono and thus the artisan would look to those references that avoid an effect on light absorption (e.g., discoloration). There are clearly common concerns in the applied references that motivate the proposed modifications. Additionally, the level of skill is sufficiently high that the artisan in the electrophotographic arts would have found it obvious use the electroconductive powders of Bergmann in an electroconductive exterior layer in Rokutanzono to reduce the presence of toxic, environmentally hazardous materials and avoid discoloration.

It is not necessary for the art to recognize the same utility and advantage recognized by applicant in order to establish *prima facie* obviousness. Rather the art must reasonably suggest the claimed photosensitive members and specifically suggest the claimed tantalum-doped tin oxide powder in an exterior electroconductive layer of a photosensitive member. See *In re Dillon*, 16 USPQ2d 1897. The art makes such a suggestion for the reasons of reduced presence of toxic, environmentally hazardous materials and avoidance of discoloration. The Examiner has met the requisite burden of showing obviousness within the meaning of § 103.

Although Rokutanzono does not describe tantalum-doped tin oxide, the reference does disclose the use of antimony doped tin oxide as an effective metal oxide for electrical-conductivity in a photosensitive member surface layer. The reference specifically discloses a particle size of 0.3 micrometers, which falls within the scope of the claims under appeal. The supporting reference teaches that conductivity, transparency and health and environmental benefits can be obtained by doping a tin oxide with tantalum rather than antimony-containing tin oxide. Although this reference does not disclose using the tantalum doped tin oxide in a photosensitive member's exterior layer, the reference clearly teaches that conductivity is

obtained from these particles. Conductivity is a requisite feature of the tin oxide in each reference and thus Bergmann is relevant prior art. The artisan would look to Bergmann from Rokutanzono in order to obtain the health and environmental benefits disclosed while expecting acceptable conductivity and transparency.

Hindsight was not employed in the instant rejection. The art motivates the combination of references in order to obtain environmentally acceptable composition as compared to metal-containing antimony-doped powders. The combination is further motivated because a layer of Bergmann's powder can be formed from an aqueous dispersion which is more desirable than less environmentally acceptable organic solvents while still providing a transparent layer (see Rokutanzono col. 2, l. 9-13).

The evidence in the specification has been considered but is not persuasive to show an unexpected result for the claimed invention. Initially, none of the examples (summarized in Table 2, p. 44) disclose a treated-tin oxide as used in Rokutanzono's surface layer. Further, Example 1 and Reference Example 1 appear to be the same because each contains Ta-doped tin oxide and are identical in all respects. However, the results for these two examples are different. Reference Example 1 has results substantially different from Example 1, but no reason for this difference is apparent in the specification or from appellants' remarks during prosecution.

The evidence is also not persuasive because there is no indication what the symbol "±" denotes in the discussion of "Image Evaluation" and "Layer Shaving" on page 44. Should this symbol have the same meaning as "0", the evidence would still not be persuasive because the difference between the presumed meaning of "0" and the meaning of "X" for "Layer "Shaving" can be nearly the same value. For example, a shaving amount of 1 micron would receive the value "X" while a shaving amount of just less than 1 micron (e.g., 0.99 microns) would receive a

value of "0". Such a difference would not be considered to be unexpected because the values are nearly identical, even though the receive different denotations. The manner of determining the amount of shaving is not disclosed by the declaration and, thus, it is unclear if the test is statistically significant. It is also unclear that the how significant the difference is between "0" and "X" for "Image Evaluation". There is no indication in the evidence that a light density fog or unsharpness is significant to the artisan.

Because the comparison is not with the closest prior art and the significance of the data is not apparent, the evidence does not obviate the rejection.

The combination of Rokutanzono and Bergmann reasonably suggests the claimed invention for the reasons of record.

With respect to the rejection of Rokutanzono and Bergmann with Borsenberger, no specific reasons for traversal are presented for this combination. Presumably this is because claims 34 and those dependent (specifically addressed by this rejection) are grouped with claims 13 and those dependent.

In any event the Examiner maintains this rejection for the reasons given above and because Borsenberger specifically teaches the benefits of organic charge generating compounds and charge transport layers having a binder resins and a charge transporting component. Borsenberger shows these components as well known in the art for organic photoreceptors.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

CHRISTOPHER RODEE
PRIMARY EXAMINER

cdr
March 24, 2003

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